

Remarks

Claims 1-14 are pending.

Claim 10 has been amended.

Claims 1-14 are submitted herein for review.

No new matter has been added.

The Examiner has rejected claim 10 under 35 U.S.C. 112. Applicant has amended claim 10 accordingly and respectfully requests that the objection be withdrawn.

Turning to the substantive rejection, the Examiner has rejected claims 1-9 under 35 U.S.C. 103(a) as being unpatentable over Shiao et al. (U.S. Patent No. 5415817) in view of Spitzer et al. (U.S. Patent No. 6023372) in further view of Bakalar (U.S. Patent No. 4778632.) Applicant respectfully disagrees with Examiner's claim of obviousness and offers the following remarks in response.

Claim 1 is directed to a method of fabricating a light duct of thermoplastic material. The duct has a light relay constituted by a rectangular section bar for conveying light along its longitudinal axis referred to as a first axis and provided at one of its ends both with a wall that is inclined relative to the first axis and with a lens. The axis of revolution of the lens is contained in a longitudinal plane of symmetry. The duct presents a given maximum height beyond the thickness of the lens and a given mean length along its longitudinal axis. The duct is made as a single piece by injection molding; the thermoplastic material in a mold presenting a cavity of a shape identical to that of the duct. The injection takes place through a feed orifice disposed on one side of the cavity

over a face that is substantially parallel to the plane defined by the axes. The feed orifice presents a height lying in the range of $0.2 H_{\max}$ and H_{\max} and a length lying in the range of $0.2 L_{\text{moy}}$ and $0.8 L_{\text{moy}}$. The thermoplastic material is injected at a rate lying in the range of $400 \text{ mm}^3/\text{s}$ to $1500 \text{ mm}^3/\text{s}$.

According to the arrangement of claim 1, the feed orifice is disposed on one side of the cavity over a face that is substantially parallel to the plane defined by the axes. The feed orifice presents a height lying in the range of $.2 H_{\max}$ and H_{\max} and a length lying in the range of $.2 L_{\text{moy}}$ and $.8 L_{\text{moy}}$. The thermoplastic material is injected at a rate lying in the range of $400 \text{ mm}^3/\text{s}$ to $1500 \text{ mm}^3/\text{s}$.

As per paragraph [0007] of the present application one advantage of the present invention is that it is:

“a method of fabrication that is simple and fast and more suitable for mass production, while ensuring light transmission of good quality by ensuring excellent uniformity of its constituent material, thereby serving to avoid any deformation of the transmitted image.”

The cited prior art, namely Shiao discloses a method of fabricating a concave optical lens by injection molding of thermoplastic material in a mold.

The Spitzer reference describes a light duct having a light relay made up of a rectangular section bar for conveying light along its longitudinal axis referred to as the first axis, and provided at one of its ends both with a wall that is inclined relative to the first axis and with a lens, the axis of revolution of the lens being contained in a longitudinal plane of symmetry.

The Bakalar reference discloses a method of fabricating a concave optical lens by injection molding of thermoplastic material in a mold. The corresponding mold has a

feed orifice and a gate. Because the gate is larger than the window width defined by the mold the window width determines the resin fill speed. By adjusting the window width the resin fill speed can be controlled for the particular lens to be molded and a lens having a minimum stress can be produced. The gate is larger than the window width defined by the mold and the window width is adjusted in order to control the resin fill speed.

Applicant respectfully submits that the cited prior art, namely Shiao, Spitzer and Bakalar do not alone or in combination disclose all of the elements of claim 1. One of ordinary skill in the art wishing to manufacture the optical duct described in Spitzer by injection molding of thermoplastic resin has to choose the position of a feed orifice and the dimensions of the orifice. Bakalar suggests to dispose the feed orifice on the side of an optical lens and to implement a feed orifice larger than the width of the window of molding of the lens. However, as described above, the optical duct according to claim 1 is not at all a symmetrical revolution element such as a lens and it is not obvious to determine that the best position of the feed orifice is on one side of the cavity over a face that is substantially parallel to the plane defined by the axes. Likewise, the Shiao reference which concerns the molding of a concave optical lens does not suggest the element of a feed orifice being disposed on one side of the cavity over a face that is substantially parallel to the plane defined by the axes.

Furthermore, according to claim 1, the feed orifice is equal to or smaller than height H_{\max} which can be considered as equivalent to the window width, with detailed ranges of values. This element of claim 1 is contrary to the teaching in Bakalar.

As such, even if the references are combined as suggested by the Examiner,

Applicant respectfully submits that the combined references do not teach or suggest all of the elements as claimed in independent claim 1. For example, neither Shiao, Spitzer nor Bakalar, either alone or in combination with one another, teach or suggest that *a feed orifice disposed on one side of the cavity over a face that is substantially parallel to the plane defined by the axes, the feed orifice presenting a height lying in the range of $0.2 H_{max}$ and H_{max} and a length lying in the range of $0.02 L_{may}$ and $0.8 L_{may}$, the thermoplastic material being injected at a rate lying in the range $400 \text{ mm}^3/\text{s}$ to $1500 \text{ mm}^3/\text{s}$.*

Applicant respectfully requests that the rejection of independent claim 1 be withdrawn. Likewise, as claims 2-14 depend from claim 1, these claims should be allowed for at least the same reasons.

Applicant respectfully submits that pending claims 1-14 are in condition for allowance, the earliest possible notice of which is earnestly solicited. If the Examiner feels that an interview would facilitate the prosecution of this Application he is invited to contact the undersigned at the number listed below.

Respectfully submitted,
SOFER & HAROUN, L.L.P.

By JOSEPH SOFER/
Joseph Sofer
Reg. No 34,438
317 Madison Avenue
Suite 910
New York, NY 10017
(212) 697-2800
Customer Number 39600

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